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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,027	10/25/2001	Paul Robert Hoffman	G0052	8885

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EXAMINER

ZARNEKE, DAVID A

ART UNIT PAPER NUMBER

2827

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/040,027

Applicant(s)

HOFFMAN, PAUL ROBERT

Examiner

David A. Zarneke

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 21-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-14 and 21-25 in the paper dated 12/29/03 is acknowledged. The traversal is on the ground(s) that the second restriction "amounts to unwarranted piecemeal examination". This is not found persuasive because restriction is always proper in an application, especially before examination of the claims, when two separate inventions are claimed. This application contains two separate inventions, as laid out in the previous office action.

Further, the section of the MPEP that was relied upon in the response (MPEP 707.07(g)) is not directed to restriction practice. The section cited is directed to examination of claims, not restriction practice.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7, 8, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Gramann et al., US Patent 5,907,151.

Gramann teaches an image sensor package comprising:

a transparent substrate (7) comprising a base surface (9) and a pocket sidewall (10 & 11);

a trace coupled to said base surface (12);

an image sensor (1) comprising a first surface comprising an active area (6) and a bond pad (22); and

a bump (5, 54+) coupling said bond pad to said trace, wherein said image sensor is located within an image sensor pocket of said transparent substrate defined by said base surface and said pocket sidewall (Figure 1).

Regarding claim 2, Gramann teaches said transparent substrate further comprises a rear surface (24 & 25), said pocket sidewall extending between said base surface and said rear surface, wherein said trace extends from said base surface, along said pocket sidewall, and to said rear surface (figure 1).

With respect to claim 3, Gramann teaches said trace comprises a first portion extending along said base surface to said pocket sidewall; a second portion extending along said pocket sidewall from said base surface to said rear surface; and a third portion extending along said rear surface (figure 1).

As to claim 4, Gramann teaches said first portion, said second portion, and said third portion are integral (figure 1).

In re claim 7, Gramann teaches said image sensor is entirely within said image sensor pocket (figure 1).

Regarding claim 8, Gramann teaches said image sensor comprises a second surface below said rear surface of said transparent substrate (figure 1).

With respect to claim 13, Gramann teaches an underfill (29) filling a region between said first surface of said image sensor and said base surface (figure 1).

As to claim 14, Gramann teaches the underfill contacts and protects said active area (figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 5, 6, 9, 10, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gramann et al., US Patent 5,907,151, as applied to claim 1 above.

Regarding claim 5, while Gramann fails to teach coupling a ball to the third portion, it would have been obvious to one of ordinary skill in the art at the time of the invention to couple a ball to the third portion because attaching balls to terminals is conventionally known in the art. The use of conventional materials to perform there

known functions in a conventional process is obvious (*In re Aller* 220 F.2d 454,456,105 USPQ 233,235 (CCPA 1955)).

With respect to claim 6, while Gramann fails to teach coupling a pad to the third portion, it would have been obvious to one of ordinary skill in the art at the time of the invention to couple a pad to the third portion because attaching pads to terminals is conventionally known in the art. The use of conventional materials to perform there known functions in a conventional process is obvious (*In re Aller* 220 F.2d 454,456,105 USPQ 233,235 (CCPA 1955)).

As to claims 9 and 10, while Gramann teaches the second surface of the sensor to be formed below the rear surface of the transparent substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the second surface coplanar with or above the rear surface of said transparent substrate because, barring a showing of unexpected results, the location of the sensor in the package is a mere matter of design choice. Design choices and changes of size are generally recognized as being within the level of ordinary skill in the art (MPEP 2144.04(d)).

In re claims 11 and 12, while Gramann fails to teach a bead forming a seal between a periphery of said image sensor and said base surface (claim 11) such that said image sensor, said bead, and said base surface define a cavity, said active area being located within said cavity (claim 12), it would have been obvious to one of ordinary skill in the art at the time of the invention to form a bead such that a cavity is formed because forming beads around the periphery of a chip is conventionally known in the art. The use of conventional materials to perform there known functions in a

conventional process is obvious (*In re Aller* 220 F.2d 454,456,105 USPQ 233,235 (CCPA 1955)).

Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gramann et al., US Patent 5,907,151, in view of Lee et al., US Patent 5,986,334.

Gramann teaches an image sensor package comprising:

a transparent substrate (7) comprising a base surface (9) and a pocket sidewall (10 & 11);

a trace coupled to said base surface (12);

an image sensor (1) comprising a first surface comprising an active area (6) and a bond pad (22); and

a bump (5, 54+) coupling said bond pad to said trace, wherein said image sensor is located within an image sensor pocket of said transparent substrate defined by said base surface and said pocket sidewall (Figure 1).

Gramann fails to teach the base and the pocket sidewall being two separate pieces coupled together.

Lee (figure 6) teaches a semiconductor package comprising:

a substrate comprising:

a base (60);

a pocket ring (20) coupled to said base; and

a chip (10) comprising a first surface comprising an active area and a bond pad (11), wherein said chip is located within a chip pocket of said substrate.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the two piece substrate of Lee in the invention of Gramann because Lee teaches the equivalence between a two substrate (figure 6) and a one piece substrate (figure 1).

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416 (CCPA 1960); *Graver Tank & Manufacturing Co. V. Linde Air Products Co.* 85 USPQ 328 (USSC 1950)).

Regarding claims 22 and 23, while Gramann appears to only teach a square base and pocket ring (figures 1B, 8A & 8D), barring a showing of unexpected results, changes of size or shape are within the ordinary level of skill in the art. Design choices and changes of size or shape are generally recognized as being within the level of ordinary skill in the art (MPEP 2144.04(d)).

With respect to claims 24 and 25, while Lee only teaches in passing the bonding of the base and the pocket ring (10, 20+), the use of glue to bond them together (claim 24) or laminating them together (claim 25) are both conventionally known in the art methods of bonding two pieces together. The use of conventional materials to perform there known functions in a conventional process is obvious (*In re Aller* 220 F.2d 454,456,105 USPQ 233,235 (CCPA 1955)).

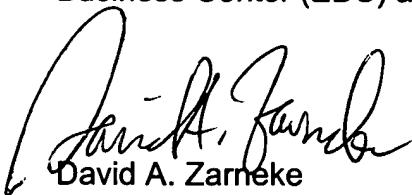
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Durocher et al., US Patent 6,614,103 (figure 7), Hirataka et al., US Patent 5,675,684 (figure 6), Manteghi, US Patent 5,710,695, Fukutomi et al., US Patent 6,268,648, and Nakamura, US Patent 6,538,322, are all cited as teaching very similar to the presently claimed invention.

Any inquiry concerning this communication from the examiner should be directed to David A. Zarneke at (571)-272-1937. The examiner can normally be reached on M-F 10 AM-6PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)-272-1957. The fax phone number for the organization where this application is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David A. Zarneke
Primary Examiner
March 31, 2004